

CLAIMS:

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- 5 1. An apparatus for dispensing particles onto a surface comprising:
a hopper for receiving particles including:
 a hopper opening;
 a screen disposed so as to cover the hopper opening; and
 a brush disposed proximate to the screen such that bristles on the
 brush contact the screen;
- 10 a cradle rotatably supporting the brush wherein the brush includes a
 longitudinal axis; and
- 15 a pivot mount secured to the cradle, the pivot mount having a pivot axis
 disposed perpendicularly with respect to the longitudinal axis of the
 brush so as to allow the brush to rotate about the pivot axis of the pivot
 mount.
- 20 2. The apparatus of claim 1 wherein the pivot mount supportably engages the
 hopper with the cradle.
- 25 3. The apparatus of claim 1 and further comprising:
 a cradle in supportive engagement with the brush; and
 a quick-release mechanism securing the brush to the cradle.
- 30 4. The apparatus of claim 3 wherein the quick-release mechanism comprises:
 a spring loaded mandrel secured to one of the brush and the cradle; and
 at least one receptacle disposed in the other of the brush and the cradle
 configured so as to supportably receive the mandrel.
- 35 5. The apparatus of claim 1 wherein the screen further comprises:
 a screen portion;
 a first support bar fixably attached to the screen portion and releasably
 secured to the hopper at a first mounting point;
 a second support bar generally parallel to the first support bar, and
 releasably secured to the hopper at a quick-release second mounting point; and

wherein the first mounting point is disposed on one side of the hopper opening and the second mounting point is disposed on another second side of the hopper opening.

5 6. The apparatus of claim 1 wherein the second mounting point further comprises:

a spring biased mount, moveable with respect to the hopper such that overcoming the spring bias allows the first bar to be secured or unsecured from the first mounting point.

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7. The apparatus of claim 1 further comprising:

a cradle rotatably supporting the brush; and

at least one bristle pattern disposed on an outer annular surface of the brush.

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8. The apparatus of claim 1 wherein the screen further comprises:

at least one pattern formed by a mask over the screen.

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9. The apparatus of claim 1 and further comprising:

a shutter disposed proximate the screen so as to selectively allow particles through the screen.

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10. The apparatus of claim 1 and further comprising:

a feedback loop disposed so as to receive a signal from a monitoring device and vary the rate of dispensation of the particles.

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11. The apparatus of claim 10, wherein the monitoring device comprises:

a source configured to emit radiation;

a detector disposed so as to receive radiation emitted from the radiation source;

a radiation path defined by the distance between the source and the detector, the radiation path disposed between the brush and the surface; and

a calculation device configured so as to compare the amount of radiation emitted by the source to the amount received by the detector.

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12. The apparatus of claim 11, wherein the radiation is visible light.
13. The apparatus of claim 10, wherein the monitoring device comprises:
5 a power source;
an electrical circuit formed by the power source, particles disposed in the hopper, the surface, and particles disposed between the hopper and the surface; and
 a calculation device configured so as to measure the amount of electrical current in the electrical circuit.
14. The apparatus of claim 10, wherein the monitoring device comprises:
at least one force sensor fixed to the hopper; and
a calculation device configured so as to measure the change in weight of the hopper.
15. The apparatus of claim 10, further comprising:
a cradle rotatably supporting the brush;
a drive mechanism engaged so as to provide motivating force to the brush;
and
a feedback loop connected to the monitoring device so as to vary the amount of motivating force provided by the drive mechanism.
16. The apparatus of claim 1 wherein the surface is a particle surface of a streaming web and further comprising:
at least one nip roller disposed downstream along the web from the brush;
a liner secured to the web downstream along the web from the brush; and
wherein the liner is disposed between the particle surface of the web and the nip roller.
17. A method for dispensing particles onto a surface comprising:
holding the particles in a hopper having an opening;
dispensing a screen over the opening;
passing bristles of a brush across the screen;
drawing the particles through the screen with the brush; and
dispersing the particles into the air such that they settle onto the surface.
- or similar*

18. The method of claim 17 and further comprising:
rotating the brush about a longitudinal axis; and
pivoting the brush about an axis perpendicular to the longitudinal axis.
 19. The method of claim 17 and further comprising:
holding the brush proximate to the screen using a cradle;
releasing the brush from the cradle using a quick-release mechanism; and
securing the brush to the cradle using the quick-release mechanism.
 20. The method of claim 19 wherein the releasing step further comprises:
retracting a spring loaded mandrel fixably secured to one of the brush and the cradle from a receptacle disposed in the other of the brush and the cradle.
 21. The method of claim 17 further comprising:
fixably securing a first support bar to the screen and releasably securing the first bar to the hopper on one side of the opening at a quick-release first mounting point;
fixably securing a second support bar to the screen such that the second support bar is generally parallel to the first support bar;
releasably securing the second bar to the hopper on an opposite side of the opening; and
disposing the second support bar generally parallel to the first support bar.
 22. The method of claim 21 wherein the step of releasably securing the second bar further comprises:
translating a spring loaded moveable portion of the quick-release first mounting point away from a biased position;
attaching the first bar to the quick-release; and
allowing the spring loaded moveable portion of the quick-release first mounting point to return to the biased position.
 23. The method of claim 17 and further comprising:
forming a series of bristle patterns on an outer annular surface of the brush.

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24. The method of claim 17 and further comprising:
blocking the passage of particles through certain parts of the screen.
- 5 25. The method of claim 17 and further comprising:
monitoring a rate of dispensation of the particles.
- 10 26. The method of claim 25 wherein the step of monitoring further comprises:
emitting radiation from a source;
receiving the radiation with a detector;
defining a radiation path between the source and the detector;
disposing the radiation path through the dispersed particles; and
calculating the amount of dispersed particles by comparing the radiation emitted to the radiation received.
- 15 27. The method of claim 25 wherein the step of measuring further comprises:
electrically charging the particles in the hopper; and
calculating the current delivered to the surface by the charged particles.
- 20 28. The method of claim 25 wherein the step of monitoring further comprises:
weighing the hopper and particles before particles are dispersed;
weighing the hopper after particles are dispersed; and
calculating the amount of dispersed particles by comparing the weight of the hopper before dispersing particles to the weight of the hopper after dispersing particles.
- 25 29. The method of claim 24 and further comprising:
rotating the brush; and
altering the rotational speed of the brush according to the monitoring rate of dispensation.
- 30 30. The method of claim 16 and further comprising:
continuously translating the surface in one direction under the brush;
disposing a liner over the surface and settled particles; and
translating the liner between the surface and a nip roller.